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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,988	03/22/2001	Noriko Suehiro	205040US0	2664

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
RUDE, TIMOTHY L	

ART UNIT	PAPER NUMBER
2883	

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/813,988	SUEHIRO ET AL.	
	Examiner	Art Unit	
	Timothy L. Rude	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *4,7,9 and 11-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,6,8,10,22 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of claims unchanged since non-final rejection Mailed 26 January 2005.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

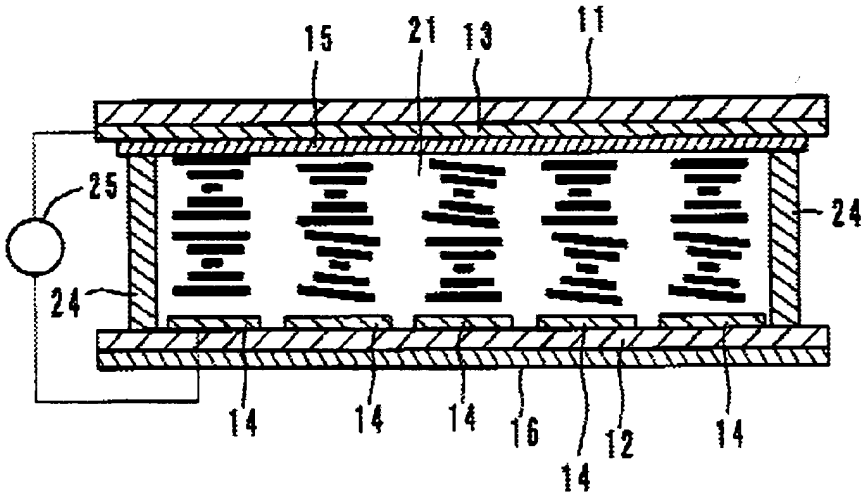
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5, 6, 8, 10, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamatsu et al (Iwamatsu) USPAT 6,348,961 B2 in view of Morokawa et al (Morokawa) USPAT 5,654,782.

As to claims 1, 2, 22, and 23, Iwamatsu discloses [Figure 1, embodiment two, col. 32, line 37-46, which has the same structure as embodiment one, col. 3, line 3, through col. 32, line 36, as constructed in numerous examples including comparative example two, col. 35, lines 24-53], a chiral nematic liquid crystal display (LCD) element that switches between the planar and focal-conic states with gray state capability comprising a front side substrate, 11, having a front side electrode, 13, a rear side substrate, 12, having a rear side electrode, 14, and a liquid crystal layer, 21, interposed therebetween wherein the liquid crystal layer exhibits a plurality of display states; a

display state is changed by a voltage applied across the electrodes, with the electrically off state being maintained stably, the liquid crystal display element being characterized in that at least a part of the front side electrode and the front side substrate is transparent [0081]; the front side electrode is divided into a plurality of electrode regions (per Figure 5) on its substrate surface, and the thickness d (μm) of the liquid crystal layer is 7 μm [col. 33, lines 42-49].

FIG. 2



Iwamatsu does not explicitly disclose an element wherein the maximum space a (μm) between adjacent electrode regions and the thickness d (μm) of the liquid crystal layer satisfy a relational formula of $1.0 \cdot d \leq a \leq 4.0 \cdot d$.

Morokawa teaches in the Background of the Invention the conventional use of a pixel size of 100 to 200 μm to make the pixels non-distinct (better picture resolution, applicable and combinable with any type of liquid crystal matrix display, regardless of mode and liquid crystal material type) (col. 2, lines 24-28). Morokawa also teaches the

use of gaps between adjacent pixels that are about 10% of the pixel dimension in order to obtain an aperture ratio of at least 80%. Those conditions result in 10 μm ≤ a ≤ 20 μm.

Please note this Background teaching of Morokawa is a broad-based teaching as to the motivation in the art to make any pixilated liquid crystal display, regardless of whether it is chiral nematic, into a high resolution display with non-distinct pixels having good aperture ratio for "easier to view" "not distinct" pixels. In other words, Morokawa teaches, years before the claimed invention was made, the motivation to make any pixilated liquid crystal display (which would naturally include any chiral nematic display) an easier to view display having finely pitched pixels (100 to 200 μm) with a small inter-pixel spacing (10% or 10 to 20 μm) for good aperture ratio. Morokawa is considered solid evidence that one of ordinary skill in the art of liquid crystals would be strongly motivated to modify *any* pixilated liquid crystal display to have a fine pitch between 100 to 200 μm with an inter-pixel spacing [Applicant's "a"] of 10 to 20 μm.

Morokawa is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use a pixel size of 100 to 200 μm to make the pixels non-distinct with the LCD of Iwamatsu for easier to view (superior) display performance. This would result in 10 μm ≤ a ≤ 20 μm thereby satisfying $1.0 \cdot d \leq a \leq 4.0 \cdot d$, where d = 7 μm, specifically 7 μm ≤ a ≤ 24 μm.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Iwamatsu with

the small electrode size and spacing of Morokawa to produce a high-resolution display with non-distinct pixels for easier to view, superior display performance.

Iwamatsu does not explicitly disclose in embodiment one a maximum space a (μm) between adjacent electrode regions, the thickness d (μm) of the liquid crystal layer, and the maximum effective voltage Vmax(V) of a voltage applied to the front side electrode and the rear side electrode satisfy a relational formula of $1.0 \cdot d \leq a \leq d \cdot Vmax/10$.

Iwamatsu also teaches in the examples use of voltages of 35 volts applied and greater.

Morokawa teaches the use of a pixel size of 100 to 200 μm to make the pixels non-distinct (better picture resolution) (col. 2, lines 24-28). Morokawa also teaches the use of gaps between adjacent pixels that are about 10% of the pixel dimension in order to obtain an aperture ratio of at least 80%. Those conditions result in $10\ \mu m \leq a \leq 20\ \mu m$.

Morokawa is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use a pixel size of 100 to 200 μm to make the pixels non-distinct with the LCD of Iwamatsu. This would result in $10\ \mu m \leq a \leq 20\ \mu m$ thereby substantially satisfying $1.0 \cdot d \leq a \leq d \cdot Vmax/10$, where $d = 7\ \mu m$, specifically $7\ \mu m \leq a \leq 19.2\ \mu m$.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Iwamatsu with

the electrode size and spacing of Morokawa to produce a high-resolution display with non-distinct pixels and to facilitate quick and reliable transition (faster switching).

Applicants enabling disclosure (Specification, page 15, line 18, through page 18, line 8) provides the structural requirements to achieve a liquid crystal layer in the interline portions that remains in a focalconic state. Those structural requirements and driving voltages are met by the display of Iwamatsu in view of Morokawa above.

As to claim 3, Iwamatsu discloses application of 30 V and 50 V (Applicant's 48 V or less) and d = 5 μm (Applicant's 2.5 μm $\leq$ d $\leq$ 6.0 μm) [col. 35, lines 24-53]. Also, the trend in the LCD industry is to move towards smaller dimensions of d.

As to claim 5, Iwamatsu in view of Morokawa discloses a LCD display as described above.

Iwamatsu discloses both electrodes are in the form of strips [col. 3, lines 16-20].

As to claim 6, Iwamatsu in view of Morokawa discloses a LCD display as described above.

Iwamatsu does not explicitly disclose the claimed electrode line density.

Morokawa, as combined above, teaches the use of a pixel size if between 100 and 200 μm to achieve a high-resolution display with non-distinct pixels, as described in the rejection of claim 2, above. This results in a disposition density Ld (number/mm) of

the stripe-like electrodes that is substantially $5 \leq Ld \leq 10$ (well within Applicant's $2 \leq Ld \leq 15$).

As to claim 10, Iwamatsu a passive matrix device [strip electrodes]. This would result in a dot matrix display wherein figures and characters may be displayed.

Also, Morokawa teaches the use of a passive matrix device as described in the rejection of claim 5, above.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamatsue in view of Morokawa as applied to claims 2 and 5 above, and further in view of Masuzawa 6,765,638 B1.

As to claim 8, Iwamatsu in view of Morokawa teach the display of claim 5.

Iwamatsu in view of Morokawa do not explicitly disclose reflective rear electrodes.

Masuzawa teaches the use of a reflective rear electrode in a passive matrix reflective or transflective liquid crystal display to achieve simplified manufacture and bright high-quality image [Abstract].

Masuzawa is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add Iwamatsu in view of Morokawa Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Iwamatsu in view of

Morokawa with a reflective rear to achieve simplified manufacture and bright high-quality image.

Response to Arguments

Applicant's arguments filed on 26 April 2005 have been fully considered but they are not persuasive.

Applicant's ONLY substantive arguments are as follows:

(1) Regarding base claims, Iwamatsu fails to disclose that the liquid crystal in the interline portions remains in a focal conic state, and Iwamatsu fails to disclose the functional relationships between a, d, and Vmax.

(2) Regarding base claims, there is no disclosure in the prior art on how to control the alignment state in the interline portion.

(3) Dependent claims are allowable because they directly or indirectly depend from an allowable base claim.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that Applicant's enabling disclosure teaches that the liquid crystal material in the interline portions will remain in a focal conic state given the functional relationships between a, d, and Vmax are met. The combination of Iwamatsu in view of Morokawa result in a display that meets Applicant's claimed functional relationships between a, d, and Vmax; therefore, Applicant teaches that the

liquid crystal material in the interline portions of the display of Iwamatsu in view of Morokawa will remain in a focal conic state since it meets the structural requirements for same as taught in Applicant's enabling disclosure.

Please note that this is not improper hindsight. Applicant's claims are to a device that must be defined structurally; satisfaction of the structural limitations must meet the claimed performance, lest Applicant's claim and/or specification be not enabled.

(2) It is respectfully pointed out that the combination of Iwamatsu in view of Morokawa result in a display that meets Applicant's claimed functional relationships between a, d, and Vmax; therefore, Applicant teaches that the liquid crystal material in the interline portions of the display of Iwamatsu in view of Morokawa will remain in a focal conic state since it meets the structural requirements for same as taught in Applicant's enabling disclosure. Please also note that method of using (e.g., voltage pulse) recitations in the specification or claims generally have little if any weight in a device claim. Device claims are drawn to structure, not to how it is used (powered), although Applicant's claimed voltage relationship does happen to be met by Iwamatsu.

(3) It is respectfully pointed out that in so far as Applicant has not argued rejection(s) of the limitations of dependent claim(s), Applicant has acquiesced said rejection(s).

In summary, Applicant's concerns about the non-applicability of Morokawa as expressed during the interview of 11 March 2005 and as expressed in Applicant's arguments filed 26 April 2005 are considered not persuasive because the specific

invention of Morokawa is not relied upon. Morokawa is applied because his disclosure contains, in the Background of the Invention section, a teaching as to the state of the art prior to the time of the claimed invention.

The Background of the Invention section of Morokawa is a broad-based teaching as to the motivation in the art to make any pixilated liquid crystal display, regardless of whether it is chiral nematic, into a high resolution display with non-distinct pixels having good aperture ratio for "easier to view" "not distinct" pixels. In other words, Morokawa teaches, years before the claimed invention was made, the motivation to make any pixilated liquid crystal display (which would naturally include Applicant's chiral nematic display) an easier to view display having finely pitched pixels (100 to 200 μm) with a small inter-pixel spacing (10% or 10 to 20 μm) for good aperture ratio. Morokawa is considered solid evidence that one of ordinary skill in the art of liquid crystals would be strongly motivated to modify *any* pixilated liquid crystal display to have a fine pitch between 100 to 200 μm with an inter-pixel spacing [Applicant's "a"] of 10 to 20 μm.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L. Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tlr

Timothy L Rude
Examiner
Art Unit 2883

Frank G. Font
Supervisory Patent Examiner
Technology Center 2800